NUSIA GEN. NOV. FOR TWO INTERESTING HYPHOMYCETES FROM SOUTHEAST ASIA

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ABSTRACT - Two interesting dematiaceous hyphomycetes collected on palms from Singapore are described and their taxonomy discussed. Both share several features: the simple mononematous conidiophores with integrated apical monotretic conidiogenous cells and solitary, euseptate phragmoconidia. They are accomodated in a new genus, Nusia as two new species: *N. scheeleae* (type species) on *Scheelea insignis* Karst., and *N. collariata* on *Oncosperma horrida* Scheff. The former is unique in having a *Virgariella* synanamorph., the latter in the frequent presence of a collar-like structure subtending the mature conidium on the conidiophore.

RÉSUMÉ - Deux hyphomycètes dématiés sont décrits et leur taxonomie discutée dans cet article. Les 2 champignons ont des caractères communs: des conidiophores simples, mononémés avec cellule conidiogène apicale, monotrétique, intégrée et des phragmoconidies solitaires, euseptées. Ils sont regroupés dans un nouveau genre: *Nusia*, en 2 espèces nouvelles: *N. scheeleae* (esp. type) sur *Scheela insignis* Karst., et *N. colloriata* sur *Oncosperma horrida* Scheff. Le premier est caractérisé par la présence d'une synanamorphe du type *Virgariella* le second par la présence d'une structure ressemblant à une colerette entre la conidie mûre et le conidiophore.

KEY WORDS : *Nusia*, hyphomycetes, taxonomy.

As a part of the programme of work on microfungi of the tropics, the author is currently engaged in a study of his collections from southeast Asia made during his stay at the National University of Singapore in 1986-87. Two interesting collections are described here both of which are assigned to a new genus, Nusia as two new species.

DESCRIPTIONS OF THE FUNGI

1. *Nusia scheeleae* Subramanian anamorph gen. et sp. nov.

This interesting hyphomycete was collected on *Scheelea insignis* (Palmae) and is described below.

The fungus forms brownish to reddish brown, discrete colonies on the substratum. The mycelium is composed of subhyaline to reddish brown, smooth, branched hyphae, 3-5 µm wide, sparsely septate when young (Fig. 1). The colonies show two synanamorphs arising from the same hypha or mycelium or stroma (Fig. 6). One of

Fig. 1-5, *Nusia scheeleae* ex Type (S 34). Fig. 1, vegetative hypha showing the development of conidiophores. Note hypha is sparsely septate. Fig. 2, Development of conidiophores. Figs. 2-4, Conidiogenesis (tretic). Fig. 5, mature conidia.

Figs. 1-5, *Nusia scheeleae* ex Type (S 34). Fig. 1, hyphe végétative montrant le développement des conidiophores. On note que l'hyphe est peu cloisonnée. Fig. 2, développement des conidiophores. Fig. 2-4, conidiogenèse trétique. Fig. 5, conidie mûre.

them produces tretic phragmoconidia (Fig. 2-5), and the other blastic ameroconidia; the latter is a *Virgariella* (Figs. 6-9).

The tretic anamorph

The conidiophores arise laterally from discrete hyphae (Fig. 1, 2) or from compact aggregations of hyphae or stromata (Fig. 6). The conidiophores are macronematous, relatively short, simple, mononematous, erect, straight or bent or flexuous, mostly of uniform width and cylindrical (Figs. 2, 6) brown to reddish brown, 4-6-septate, up to 120 µm long and 4-6 µm wide. The conidiogenous cell is integrated, apical and monotretic (Figs. 2-4). The conidia (Fig. 5) are solitary, tretic, acrogenous, dry, elongate-obclavate or obclavate-rostrate, widest (6- 9 µm) in the lower one-third, gradually tapering above, reddish brown, paler above, fairly thick-walled, many times up to 19- (mostly 9-14)- septate, (65)-90-160 (192) µm long, 5-9 µm wide, sometimes constricted at some septa, with a distinct basal hilum, the distal part often almost whip-like, roughened in the basal part. The conidiophores may proliferate percurrently, but this is rare.

Dematiaceous anamorphs with simple conidiophores, an integrated monotretic apical conidiogenous cell and phragmoconidia are found in the genus *Corynespora* Gussow (Ellis 1971, 1976). The conidia in the type species, *C. cassiicola* (Berk. & Curt.) Wei (= *C. mazei* Gussow) are many times distoseptate, obclavate to cylindrical, subhyaline to brown, often in simple acropetal chains. The present fungus is quite distinct from *Corynespora* in having euseptate, solitary conidia. It has also a *Virgariella* synanamorph, not so far known in any *Corynespora* sp.

As far as I am aware, there is no hyphomycete genus in which the present fungus may be appropriately accomodated. It is disposed in a new genus, NUSIA as a new species, *N. scheeleae*.

***NUSIA* Subramanian anamorph gen. nov.**

Dematiaceous hyphomycete producing tretic conidia. Conidiophores macronematous, mononematous, simple, brown, septate. Conidiogenous cell integrated, apical, monotretic. Conidia solitary, obclavate, brown, euseptate, dry.

Synanamorph: *Virgariella*.

Hyphomycete dematiacea conidia tretica producens. Conidiophora macronematosa, mononematosa, simplicia, fusca, septata. Cellula conidiogena integrata, apicalia, monotretica. Conidia solitaria, obclavata, euseptata, fusca, sicca.

Synanamorphosa: *Virgariella*. (Etym. commemorating the NUS, for National University of Singapore, with which the author was associated as Visiting Professor during the tenure of which numerous collections of microfungi were made from Singapore).

Type species:

***Nusia scheeleae* Subramanian anamorph sp. nov.**

Colonies brownish to reddish brown. Mycelium composed of subhyaline to reddish brown, smooth, branched hyphae 3-5 µm wide, sparsely septate when young, often aggregated and compacted to form sclerotia-like masses. Conidiophores arising laterally from hyphae or from compact aggregations of hyphae or stromata, short, simple, erect, straight, bent or flexuous, cylindrical, brown to reddish brown, up to 6-septate, up to 120 µm long, 4-6µm wide. Conidia acrogenous, solitary, tretic, obclavate or elongate-obclavate or obclavate-rostrate, widest (5- 9 µm) in the lower one-third, tapering above, reddish brown in colour, paler above, thick-walled, 9-14(-19)-euseptate,

(65)-90-160(-192) µm long, sometimes constricted at some septa, with a distinct hilum, the distal part almost whip-like, roughened in the basal part.

Synanamorph: *Virgariella.*

Virgariella synanamorph:

Conidiophores (Fig. 6) arising from hyphae or compact aggregates of hyphae (sclerotia-like), erect or ascending, flexuous or straight or bent, pale brown to subhyaline, paler above, smooth, mostly 7-14-septate, up to 225 µm long, 2.5-4 µm wide. Conidiogenous cell (Fig. 8) integrated, apical, polyblastic. Conidia solitary, blastic, obovoid, pointed at the base, smoothly rounded at the apex, thin-walled, hyaline to subhyaline, smooth, and 6-9 x 2-5 µm (Figs.8-9).

Type: on rachis of *Scheelea insignis* Karst. (Palmae), Botanical Garden, Singapore, Coll. CVS, 12.ii.1987, No. S 34.

Clusters of *Virgariella* conidiophores without *Nusia* conidiophores may occur (Fig. 7), but yet it is clear that, when both anamorphs are present, they arise from a common mycelium or common stroma (Fig. 6), which confirms the fact that one is the synanamorph of the other.

Species typica:

***Nusia scheeleae* Subramanian anamorph sp. nov.**

Coloniae brunneolae vel rubrofuscae. Mycelium ex hyphis subhyalinis vel rubrofuscis, ramosis, parce septatis ubi juvenilis, 3-4 µm latis compositum. Conidiophora ex hyphis lateraliter oriunda vel ex stromatibus, brevia, simplicia, erecta, recta vel flexuosa, cylindrica, fusca ad rubro-fusca ad rubro-fusca, usque ad 6-septata, usque ad 120 µm longa, 4-6 µm lata. Conidia acrogena, solitaria, tretica, sicca, obclavata vel obclavato-rostrata, rubro-fusca, apicem versus pallidiora, 9-14(19)- euseptata, (65)-90-160(-192) µm longa, 5-9 µm lata, cum hilo distincta, parte supra flagelliformis, parte basali verrucosa.

Synanamorph: *Virgariella.*

Type: *ad rachidis Scheeleae insignis* Karst. (Palmae), Botanical Garden, Singapore, Coll. C.V. Subramanian, 12.11.1987, subnumero S 34.

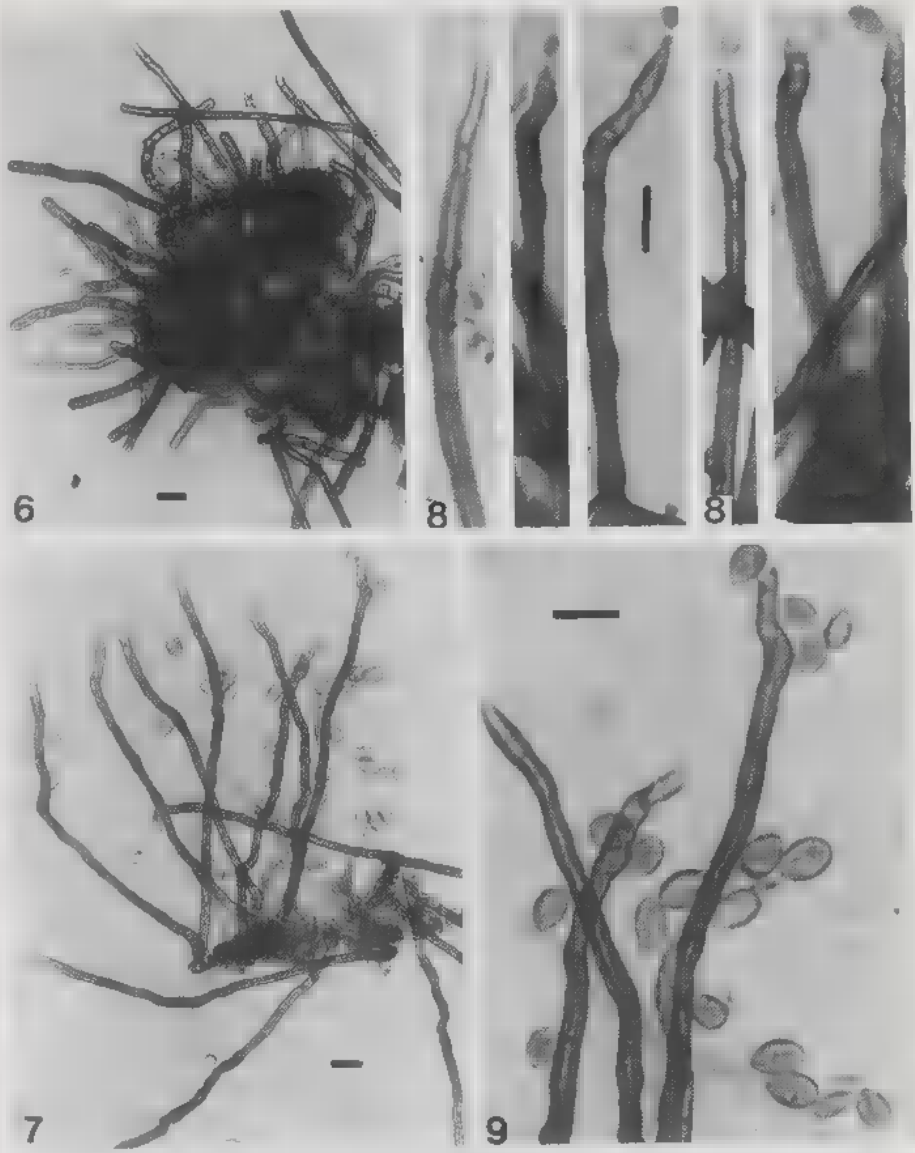
Virgariella synanamorph:

Conidiophora ex hyphis repentibus lateraliter vel ex stromatibus oriunda, erecta, recta vel flexuosa, pallide brunnea vel subhyalina, sursum pallidiora, laevia, plerumque 7-14-septata, usque ad 225 µm longa, 2.5-4.0 µm lata. Cellula conidiogena integrata, apicalia, polyblastica. Conidia solitaria, blastica, obovoidea, apiculata ad basim, rotundata ad apicem, tenuitunicata, hyalina vel subhyalina, laevia, 6-9 µm longa, 2-5 µm lata.

Ad rachidis Scheeleae insignis Karst. (Palmae), leg. C.V. Subramanian, 12.ii.1987, horto Botanico, Singapore, No. S 34.

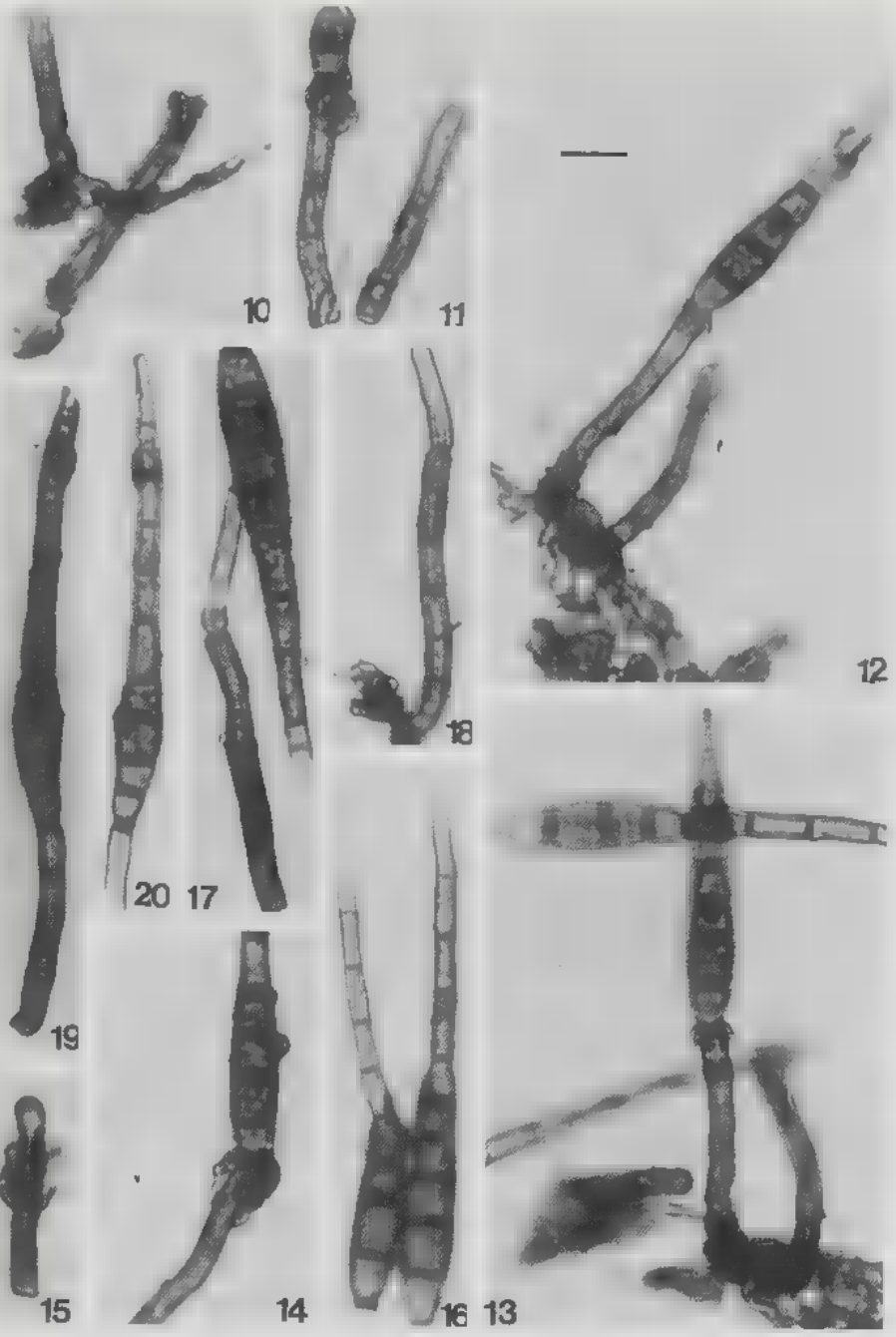
2. *Nusia collariata* Subramanian anamorph sp. nov.

Another interesting fungus was collected on *Oncosperma horrida* (Palmae) and is described below.



Figs. 6-9, *Nusia scheeleae* ex Type. Fig. 6, *Nusia* conidiophore and *Virgariella* conidiophores developing from a common stroma. Figs. 7-9, *Virgariella* synanamorph. Fig. 7, a cluster of conidiophores and some conidia; Fig. 8, conidiogenesis in the *Virgariella* morph; Fig. 9, distal part of conidiogenous cell and conidia.

Fig. 6-9, *Nusia scheeleae* ex Type. Fig. 6, conidiophores de *Nusia* et de *Virgariella* se développant à partir d'un stroma commun. Figs. 7-9, Synanamorphe *Virgariella*. Fig. 7, Bouquet de conidiophores et conidies. Fig. 8, conidiogenèse dans la forme *Virgariella*. Fig. 9 partie distale d'une cellule conidiogène et conidie.



The fungus forms brownish, effuse colonies on the substratum. The mycelium is superficial, composed of reticulate, branched, septate, subhyaline to reddish brown hyphae, thin-walled when pale-coloured, thick-walled when brown; subhyaline hyphae are less than 2µm wide; brown hyphae are 3-4 µm wide. The conidiophores arise (Figs. 12, 13, 18) from the repent mycelium or from stromata of variable size formed by an intertwining of the hyphae which ultimately become clumped together to form a compact stroma. They may also arise from cells of a single conidium. The conidiophores (Figs. 12, 13) are relatively short, macronematous, mononematous, mostly 3-6-septate, erect, straight, bent or flexuous, cylindrical, brown, paler above, monotretic (Figs. 11-14, 19- 20) up to 75 µm long, 3-4 µm wide. The conidia are solitary, dry, acrogenous, reddish brown, obclavate-elongate, rostrate, widest above the base, gradually tapering distally, paler in the distal part, subhyaline towards the tip, clearly verrucose in the lower half, (3)-6-12-septate, 80- 140 µm long, 6-8 µm in the widest part, sometimes constricted at one or a few septa in the lower part, the basal cell narrowing to a clearly thickened, flat scar (Figs. 12, 13, 16, 19, 20).

A curious feature frequently observed is the presence of a conspicuous, tattered or collapsed, collar-like structure subtending the mature conidium (Figs. 12-14) on the conidiophore. Also the surface of the mature conidium is invariably roughened (Figs. 16-17, 19-20) or marked by conspicuous presence of accretions thereon. The genesis of the collar-like is not clear. It is possible that the conidium initial, originally enclosed within a "vesicle" (Fig. 10), in its further development tears apart the "vesicle" which now persists in tattered form. If this is true, one should be able to find such a stage in the development of the conidium, but I have not seen this stage. Though a "tattered collar" is common, there are also conidiophores/conidia that do not show this (Figs. 19, 20), but the size, morphollogy and tretic ontogeny of conidia are apparently the same whether a collar is present or not. One cannot exclude the possibility of a conidium initial getting aborted and a conidium then developing percurrently, the tattered wall of the conidium initial persisting. The conidiophore may proliferate percurrently (Figs. 17-18).

The fungus is close to *Nusia* in many features; but the curious collar-like structure subtending the conidium is a feature not seen in the type species, *N. scheeleae*. Further, there is no *Virgariella* synanamorph associated with the present fungus. There is no other genus in which this fungus can be suitably accommodated. Accordingly, it is placed in Nusia as a second species, *N. collariata* sp. nov. The specific epithet refers to the frequent occurrence of a collar subtending the conidium.

Figs. 10-20. *Nusia collariata*. Fig. 10, Conidiophores; Fig. 11, conidiogenesis. Figs. 12-14, conidiophores with mature conidia still attached. Note the collar-like structure subtending the mature conidium. Fig. 15, development of collar followed by proliferation of conidiophore. Fig. 16, two mature conidia; Figs. 17, 18, percurrent conidiophore proliferation. Figs. 19-20, two mature conidia attached to conidiophore but without subtending collar-like structures. ex Type (S 61).

Figs. 10-20. *Nusia collariata*. Fig. 10, conidiophores; Fig. 11, conidiogenèse. Figs 12-14, conidiophore avec conidies mûres encore attachées. On notera la collerette à la base de la conidie mûre. Fig. 15, formation d'une collerette et prolifération du conidiophore. Fig. 16, 2 conidies mûres. Figs 17, 18, prolifération percurrente du conidiophore. Fig. 19-20: 2 conidies mûres encore attachées au conidiophore mais sans collerette basale. ex Type (S 61).

***Nusia collariata* Subramanian anamorph sp. nov.**

Colonies effuse, brownish. Mycelium superficial, composed of reticulate, branched, septate, subhyaline to reddish-brown hyphae: thin-walled and less than 2 µm wide when subhyaline, thick-walled and 3-4 µm wide when brown. Conidiophores simple, mononematous, relatively short (up to 75 µm long), 3-4 µm wide, erect, straight, bent or flexuous, cylindrical, brown, paler above. Conidia solitary, dry, acrogenous, reddish-brown, elongate-obclavate, rostrate, (3)-6-12-septate, widest above the base, gradually tapering above and drawn out into a rostrum, paler in the distal part, subhyaline towards the tip, clearly verrucose to papillose in the lower part, the basal cell with a thickened flat scar, 80-140 µm long and 6-8 µm in the widest part.

Type: on leaf rachis of *Onchosperma horrida* Scheff. (Palmae), Botanical Garden, Singapore, Coll. C.V. Subramanian, 19.ii.1987, No. S 61.

***Nusia collariata* Subramanian anamorph sp. nov.**

Coloniae effusae, fuscae. Mycelium superficiale, ex hyphis repentibus, ramosis, septatis, subhyalinis vel rubrobrunneis compositum. Conidiophora simplicia, mononematosa, brevia, usque ad 75 µm longa, 3-4 µm lata; erecta, recta vel flexuosa, cylindrica, fusca, sursum pallidiora. Conidia solituria, acrogena, tretica, rubro-brunnea, elongata, elongato-obclavata vel obclavato-rostrata, (3)-6-12-septata, sursum pallidiora, verrucosa vel papillosa ad partem infera, 80-140 µm longa, 6-8 µm lata; hilum truncatum vel incrassatum.

Typus lectus ad rachidis Oncospermae horridae Scheff. (Palmae), Horto Botanico, Singapore, leg. C.V. Subramanian, 19.ii.1987, subnumero S 61.

ACKNOWLEDGEMENT

This work was carried out during the tenure of an INSA Senior Scientist Award to me. The CSIR supported a Project on Taxonomy and Distribution of Microfungi. I thank the INSA and the CSIR for the support and the Director, CIMAP, Lucknow for having me work here and for all facilities given.

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